

Applicants: Pironti, et al.  
Application No.: 09/839,759  
Docket No: 1085-2  
Page 2

### **IN THE CLAIMS**

Please amend claims 1, 12 and 14 to read as follows:

1. (Twice Amended) A process for recovering ethane from a hydrocarbon gas stream having methane, ethane and propane comprising:

providing the hydrocarbon gas stream comprising from about 40% to about 80 % by mole methane, from about 10% to about 50 % by mole ethane and from about 0.5% to about 10 % by mole propane;

cooling the hydrocarbon gas stream by refrigeration to form a cooled hydrocarbon gas stream, wherein said cooling of said hydrocarbon gas stream by refrigeration does not include turbo-expansion of said hydrocarbon gas stream;

separating the cooled hydrocarbon gas stream into a methane-rich stream and an ethane/propane-rich stream, said methane-rich stream having a first pressure and a first temperature;

expanding said methane-rich stream from said first pressure to a second pressure to lower the temperature of said methane-rich stream from said first temperature to a second temperature to provide a cooling source for said refrigeration, wherein said second pressure is lower than said first pressure and further wherein said second temperature is lower than said first temperature;

separating said ethane/propane-rich stream into an ethane-rich stream and a propane-rich stream; and

recovering said ethane-rich stream.

Applicants: Pironti, et al.  
Application No.: 09/839,759  
Docket No: 1085-2  
Page 3

12. (Twice Amended) A process for recovering ethane from a methane, ethane and propane containing gas stream comprising:

- providing the hydrocarbon gas stream comprising from about 40% to about 80 % by mole methane, from about 10% to about 50 % by mole ethane and from about 0.5% to about 10 % by mole propane;

- cooling the hydrocarbon gas stream in a cryogenic heat exchanger to form a cooled hydrocarbon gas stream, wherein said cooling of said hydrocarbon gas stream does not include turbo-expansion of said hydrocarbon gas stream;

- distilling the cooled hydrocarbon gas stream in a demethanizer column to form a methane-rich stream and an ethane/propane-rich stream;

- compressing said methane-rich stream to form a cooled/compressed methane-rich stream;
- cooling said cooled/compressed methane-rich stream to form a compressed methane-rich stream;

- turboexpanding said compressed methane-rich stream to a lower pressure to provide a cooling source for said cryogenic heat exchanger;

- distilling said ethane/propane-rich stream in a de-ethanizer column to form an ethane-rich stream and a propane-rich stream; and

- recovering said ethane-rich stream.

14. (Twice Amended) A process for providing a methane-rich stream from a hydrocarbon stream containing methane, ethane and propane comprising:

- providing the hydrocarbon gas stream comprising from about 40% to about 80 % by mole methane, from about 10% to about 50 % by mole ethane and from about 0.5% to about 10 % by mole propane;

- cooling the hydrocarbon gas stream by refrigeration to form a cooled hydrocarbon gas stream, wherein said cooling of said hydrocarbon gas stream by refrigeration does not include

Applicants: Pironti, et al.  
Application No.: 09/839,759  
Docket No: 1085-2  
Page 4

turbo-expansion of said hydrocarbon gas stream;

separating the cooled hydrocarbon gas stream into a methane-rich stream and an ethane/propane-rich stream, said methane-rich stream having a first pressure and a first temperature;

expanding said methane-rich stream from said first pressure to a second pressure to lower the temperature of said methane-rich stream from said first temperature to a second temperature to provide a cooling source for said refrigeration, wherein said second pressure is lower than said first pressure and further wherein said second temperature is lower than said first temperature;

recovering said methane-rich stream.